

CLAIMS:

1. A woodworking machine comprising:
- an electrically conductive cutting tool mounted on a rotatable, electrically
- 5 conductive shaft;
- a contact detection system for detecting contact between a person and the cutting tool, where the contact detection system includes one or more drive electrodes adapted to impart an electrical signal onto the cutting tool; and
- a reaction system configured to cause one or more predetermined actions to take place upon detection of contact between a person and the cutting tool by the contact detection system;
- where the one or more drive electrodes are disposed adjacent the shaft to impart the electrical signal onto the cutting tool through the shaft.
2. The machine of claim 1, further comprising a frame configured to support the shaft, and where the shaft is electrically insulated from the frame.

3. The machine of claim 2, where the shaft is mounted in one or more bearings supported by the frame, and where the shaft is electrically insulated from the bearings by one or more electrically insulating components disposed between the shaft and the bearings.

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4. The machine of claim 2, where the shaft is mounted in one or more bearings supported by the frame, and where the shaft is electrically insulated from the frame by one or more electrically insulating components disposed between the bearings and the frame.

5. The machine of claim 1, where the contact detection system includes one or more sense electrodes configured to monitor the electrical signal on the cutting tool.

6. The machine of claim 5, where the one or more sense electrodes are disposed adjacent the shaft to monitor the electrical signal on the cutting tool through the shaft.

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7. The machine of claim 5, where the one or more drive electrodes are spaced-apart from the shaft to capacitively couple the electrical signal onto the shaft.

5 8. The machine of claim 7, where the one or more drive electrodes have a capacitive coupling to the shaft of at least 10 picofarads.

9. The machine of claim 1, further comprising a motor assembly configured to rotate the shaft and cutting tool, and where the one or more predetermined actions include stopping the rotation of the cutting tool.

10. A woodworking machine, comprising:

a motor;

an electrically isolated, rotatable arbor configured to be driven by the motor;

a circular blade coupled to the arbor;

an excitation system adapted to generate an electrical signal; and

a capacitive coupling adapted to capacitively couple the excitation system to the

20 arbor to transfer at least a portion of the electrical signal to the blade.

11. The machine of claim 10, where the capacitive coupling has a capacitance of at least 10 picofarads.

5 12. A woodworking machine comprising:  
a frame;  
a conductive cutting tool supported by and electrically insulated from the frame;  
a motor supported by the frame and adapted to drive the cutting tool;  
a contact detection system adapted to detect contact between a person and the cutting tool, wherein the contact detection system includes a first electrode capacitively coupled to the cutting tool to impart a signal to the cutting tool and a second electrode capacitively coupled to the cutting tool to monitor the signal imparted to the cutting tool;  
and  
a reaction system adapted to stop movement of the cutting tool upon detection of  
15 contact between a person and the cutting tool by the contact detection system.

13. The machine of claim 12, where the contact detection system includes excitation circuitry coupled to the first electrode, and where the excitation circuitry is  
20 adapted to generate a drive signal and output the drive signal onto the first electrode.

14. The machine of claim 13, where the contact detection system includes sensing circuitry coupled to the second electrode, where the sensing circuitry is adapted to sense the signal coupled to the second electrode from the cutting tool.

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15. The machine of claim 12, where the first electrode has a capacitive coupling to the cutting tool of at least 10 picofarads.

16. The machine of claim 12, further comprising a shaft electrically insulated from the frame, where the cutting tool is mounted on the shaft, and where at least one of the first or second electrodes is coupled to the cutting tool through the shaft.

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Sub P1 (continued)

17. A woodworking machine, comprising:  
an electrically conductive cutting tool;  
a motor configured to drive the cutting tool;  
a contact detection system configured to detect contact between a person and the  
5 cutting tool;  
a capacitive coupling between the contact detection system and the cutting tool;  
and  
a brake mechanism configured to engage and stop the cutting tool if contact  
between the person and the cutting tool is detected by the contact detection system;  
10 where the contact detection system is configured to impart an electrical signal onto  
the cutting tool through the capacitive coupling, and to detect contact between a person  
and the cutting tool based on changes in the electrical signal imparted to the cutting tool.

15 18. The machine of claim 17, where the capacitance of the capacitive coupling  
is at least 10 picofarads.